

I CLAIM:

1. A motorized directionally steerable trailer tongue jack for precisely positioning a tongue of a trailer, comprising:

5 a mounting plate releasably attached to the trailer, wherein the mounting plate has at least a first surface and a second surface;

a height adjustment system having a power transmission screw threadedly received by a power sleeve nut, a driving gear rotated by an actuator and adapted to rotate the power sleeve nut about the power transmission screw thereby adjusting the height of the mounting plate, and a nut support formed to receive the power transmission screw and a portion of the power sleeve nut and configured to be secured to the mounting plate first surface, wherein the mounting plate first surface and the power sleeve nut are rotably separated by a sleeve nut bearing system, and the power sleeve nut and the nut support are rotably separated by a nut support bearing system;

15 a drive system, to effect translation of the trailer, adapted to be secured to the power transmission screw, the drive system having a wheel, in contact with a rolling surface, configured to rotate within a wheel housing about an axle, wherein the wheel is driven by an actuator secured to the wheel housing;

20 a steering system, configured to be secured to the mounting plate second surface, having a steering sleeve adapted to receive the power transmission screw and fix the relative position of the steering sleeve and the power transmission screw, a driving gear rotated by an actuator and adapted to rotate the steering sleeve and thereby rotate the power transmission screw and the drive system, and a cover formed to receive a portion of the steering sleeve and configured to be

secured to the mounting plate second surface, wherein the mounting plate second surface and the steering sleeve are rotably separated by a steering sleeve bearing system;

a control system having a user pendent operatively connected to the height adjustment system actuator, the steering system actuator, and the drive system actuator, permitting a user to control the translation of the trailer via the drive system actuator, to control the direction of translation of the trailer via the steering system actuator, and control the height of the tongue of the trailer via the height adjustment system actuator.

2. The motorized directionally steerable tongue jack of Claim 1, wherein the power transmission screw and the power sleeve nut cooperate to form a self-locking system that prevents movement in relation to each other while under no influence from the driving gear.

3. The motorized directionally steerable tongue jack of Claim 2, wherein the power transmission screw is an Acme screw.

4. The motorized directionally steerable tongue jack of Claim 1, wherein the power transmission screw and the power sleeve nut cooperate to have an efficiency of at least forty-five percent.

5. The motorized directionally steerable tongue jack of Claim 2, wherein the height adjustment system further includes a failsafe follower nut working in conjunction with the power sleeve nut such that upon failure of the power sleeve nut the load is automatically transferred to the failsafe follower nut.

6. The motorized directionally steerable tongue jack of Claim 1, wherein the power sleeve nut is a self-lubricating nut formed substantially of bronze.

7. The motorized directionally steerable tongue jack of Claim 1, wherein the steering sleeve is formed with an internal keyway and the power transmission screw is formed with an external keyway, wherein the internal keyway and the external keyway cooperate to fix the relative position of the steering sleeve and the power transmission screw when a key engages each keyway.

8. The motorized directionally steerable tongue jack of Claim 1, wherein the user pendent is in wireless communication with the control system.

9. The motorized directionally steerable tongue jack of Claim 1, wherein the control system further includes a portable wireless transmitter and a transceiver, wherein the transmitter is formed to mount on hitch of a tow vehicle and emit a guidance signal and the transceiver receives the guidance signal and automatically controls the height adjustment system actuator, the steering system actuator, and the drive system actuator to position the trailer tongue in close proximity to the hitch.

10. The motorized directionally steerable tongue jack of Claim 1, wherein the drive system and power transmission screw interconnection includes a shear pin.

11. A motorized directionally steerable trailer tongue jack for precisely positioning a tongue of a trailer, comprising:

a mounting plate releasably attached to the trailer, wherein the mounting plate has at least a first surface and a second surface;

5 a self-locking height adjustment system having a power transmission screw threadedly received by a power sleeve nut, wherein the power transmission screw and the power sleeve nut cooperate to form a self-locking system that prevents relative movement while under no external influence, a driving gear rotated by an actuator and adapted to rotate the power sleeve nut about the power transmission screw thereby adjusting the height of the mounting plate, and a nut
10 support formed to receive the power transmission screw and a portion of the power sleeve nut and configured to be secured to the mounting plate first surface, wherein the mounting plate first surface and the power sleeve nut are rotably separated by a sleeve nut bearing system, and the power sleeve nut and the nut support are rotably separated by a nut support bearing system;

a drive system, to effect translation of the trailer, adapted to be secured to the power
15 transmission screw, the drive system having a wheel, in contact with a rolling surface, configured to rotate within a wheel housing about an axle, wherein the wheel is driven by an actuator secured to the wheel housing;

a steering system, configured to be secured to the mounting plate second surface, having a steering sleeve adapted to receive the power transmission screw, wherein the steering sleeve is
20 formed with an internal keyway and the power transmission screw is formed with an external keyway such that the internal keyway and the external keyway cooperate to fix the relative position of the steering sleeve and the power transmission screw when a key engages each keyway, a driving gear rotated by an actuator and adapted to rotate the steering sleeve and

thereby rotate the power transmission screw and the drive system, and a cover formed to receive a portion of the steering sleeve and configured to be secured to the mounting plate second surface, wherein the mounting plate second surface and the steering sleeve are rotably separated by a steering sleeve bearing system;

5 a control system having a user pendent operatively connected to the height adjustment system actuator, the steering system actuator, and the drive system actuator, permitting a user to control the translation of the trailer via the drive system actuator, to control the direction of translation of the trailer via the steering system actuator, and control the height of the tongue of the trailer via the height adjustment system actuator.

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12. The motorized directionally steerable tongue jack of Claim 11, wherein the power transmission screw is an Acme screw.

13. The motorized directionally steerable tongue jack of Claim 11, wherein the power
15 transmission screw and the power sleeve nut cooperate to have an efficiency of at least forty-five percent.

14. The motorized directionally steerable tongue jack of Claim 11, wherein the height
adjustment system further includes a failsafe follower nut working in conjunction with the power
20 sleeve nut such that upon failure of the power sleeve nut the load is automatically transferred to the failsafe follower nut.

15. The motorized directionally steerable tongue jack of Claim 11, wherein the power sleeve nut is a self-lubricating nut formed substantially of bronze.

16. The motorized directionally steerable tongue jack of Claim 11, wherein the user pendent
5 is in wireless communication with the control system.

17. The motorized directionally steerable tongue jack of Claim 11, wherein the control system further includes a portable wireless transmitter and a transceiver, wherein the transmitter is formed to mount on hitch of a tow vehicle and emit a guidance signal and the transceiver
10 receives the guidance signal and automatically controls the height adjustment system actuator, the steering system actuator, and the drive system actuator to position the trailer tongue in close proximity to the hitch.

18. The motorized directionally steerable tongue jack of Claim 11, wherein the drive system
15 and power transmission screw interconnection includes a shear pin.

19. A motorized directionally steerable trailer tongue jack for precisely positioning a tongue of a trailer, comprising:

a mounting plate releasably attached to the trailer, wherein the mounting plate has at least
20 a first surface and a second surface;

a self-locking height adjustment system having an Acme type power transmission screw threadedly received by a self-lubricating power sleeve nut, wherein the power transmission screw and the power sleeve nut cooperate to form a self-locking system that prevents relative

movement while under no external influence, a driving gear rotated by an actuator and adapted to rotate the power sleeve nut about the power transmission screw thereby adjusting the height of the mounting plate, a nut support formed to receive the power transmission screw and a portion of the power sleeve nut and configured to be secured to the mounting plate first surface, and a
5 failsafe follower nut formed to work in conjunction with the power sleeve nut such that upon failure of the power sleeve nut the load is automatically transferred to the failsafe follower nut, wherein the mounting plate first surface and the power sleeve nut are rotably separated by a sleeve nut bearing system, and the power sleeve nut and the nut support are rotably separated by a nut support bearing system;

10 a drive system, to effect translation of the trailer, adapted to be secured to the power transmission screw, the drive system having a wheel, in contact with a rolling surface, configured to rotate within a wheel housing about an axle, wherein the wheel is driven by an actuator secured to the wheel housing and the drive system and power transmission screw interconnection includes a shear pin;

15 a steering system, configured to be secured to the mounting plate second surface, having a steering sleeve adapted to receive the power transmission screw, wherein the steering sleeve is formed with an internal keyway and the power transmission screw is formed with an external keyway such that the internal keyway and the external keyway cooperate to fix the relative position of the steering sleeve and the power transmission screw when a key engages each
20 keyway, a driving gear rotated by an actuator and adapted to rotate the steering sleeve and thereby rotate the power transmission screw and the drive system, and a cover formed to receive a portion of the steering sleeve and configured to be secured to the mounting plate second

surface, wherein the mounting plate second surface and the steering sleeve are rotably separated
by a steering sleeve bearing system;

a control system having a wireless user pendent operatively connected to the height
adjustment system actuator, the steering system actuator, and the drive system actuator,

5 permitting a user to control the translation of the trailer via the drive system actuator, to control
the direction of translation of the trailer via the steering system actuator, and control the height of
the tongue of the trailer via the height adjustment system actuator.

20. The motorized directionally steerable tongue jack of Claim 19, wherein the control
10 system further includes a portable wireless transmitter and a transceiver, wherein the transmitter
is formed to mount on hitch of a tow vehicle and emit a guidance signal and the transceiver
receives the guidance signal and automatically controls the height adjustment system actuator,
the steering system actuator, and the drive system actuator to position the trailer tongue in close
proximity to the hitch.